

# Sahara Mustard: From Here to Gone

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# Sahara Mustard



- ❖ *Brassica tournefortii*
  - ❖ Other common names:  
Asian mustard,  
Moroccan mustard,  
desert mustard,  
southwestern mustard,  
Mediterranean mustard,  
Mediterranean turnip,  
wild turnip, prickly  
turnip, turnip weed
- ❖ Spanish: mostaza del  
Sahara, mostaza del desierto

# Identification

- ❖ Description
  - ❖ Winter annual
  - ❖ Rosette w/ 20-100cm tall flower stalk
  - ❖ 4-10 lobe pairs on leaves
  - ❖ Yellow flowers w/ 4 petals



# Identification

- ❖ Fruit cylindrical 3-7cm long 2-4 mm wide
- ❖ Fruit has a 'beak' 10-20mm long
- ❖ Fruit is spreading, i.e. not appressed to stem



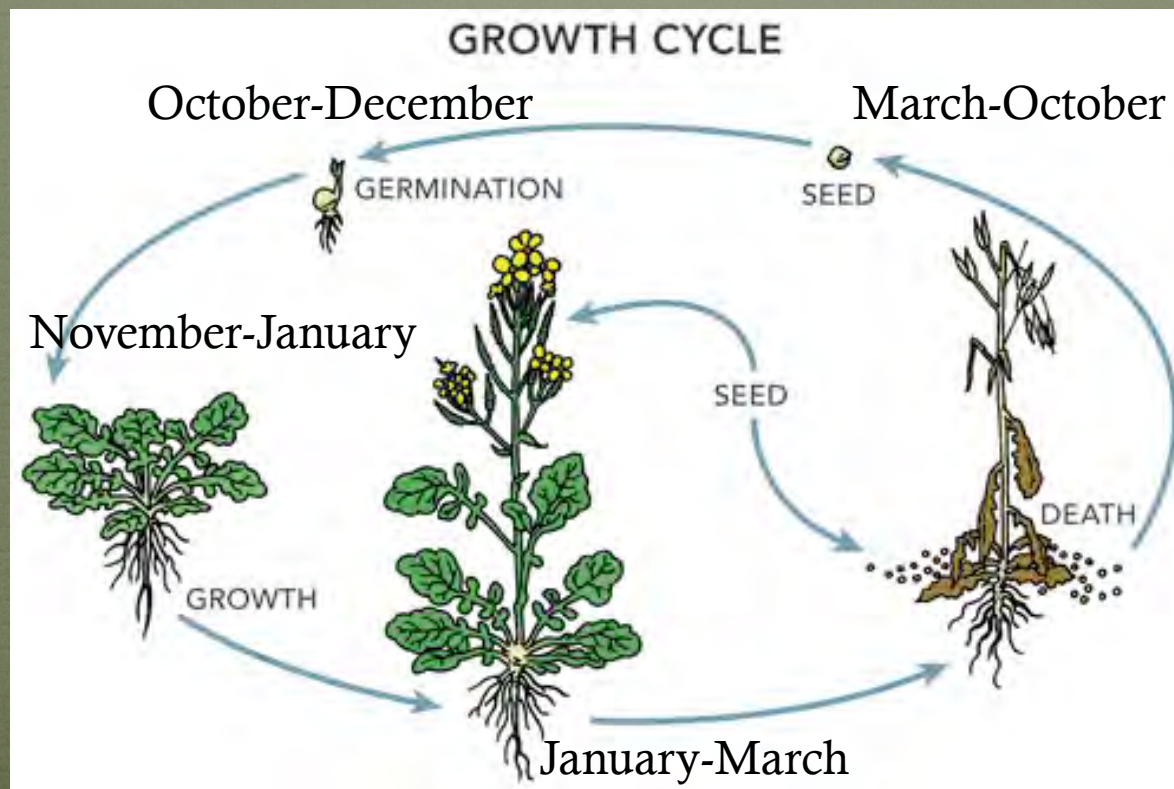
# More Pics

“Beak”



# Winter Annual

- ❖ What is a winter/spring annual?
- ❖ A plant that grows and completes its life cycle during winter and before the onset of summer (Spring Wildflower)



# Before and After

- ❖ Can transform southwest deserts and semi-arid areas, inland areas, coastal areas including beaches and central valley



1998



2005

Southern Arizona, Photos: Mark Dimmitt

# Before and After

- ❖ Can transform southwest deserts and semi-arid areas, inland areas, coastal areas including beaches and central valley



Henderson Canyon Sam and Astrid Webb



# Before and After

- ❖ Can transform southwest deserts and semi-arid areas, inland areas, coastal areas including beaches and central valley.

2008



2010



Henderson Canyon. Photos courtesy of Tubb Canyon Desert Conservancy and Ron Neibrugge [www.wildnatureimages.com](http://www.wildnatureimages.com)

# Before and After

- ❖ Before and after removal of standing dead SM plants



Tubb Canyon. Tubb Canyon Desert Conservancy Lori Paul

# Ecology of Sahara

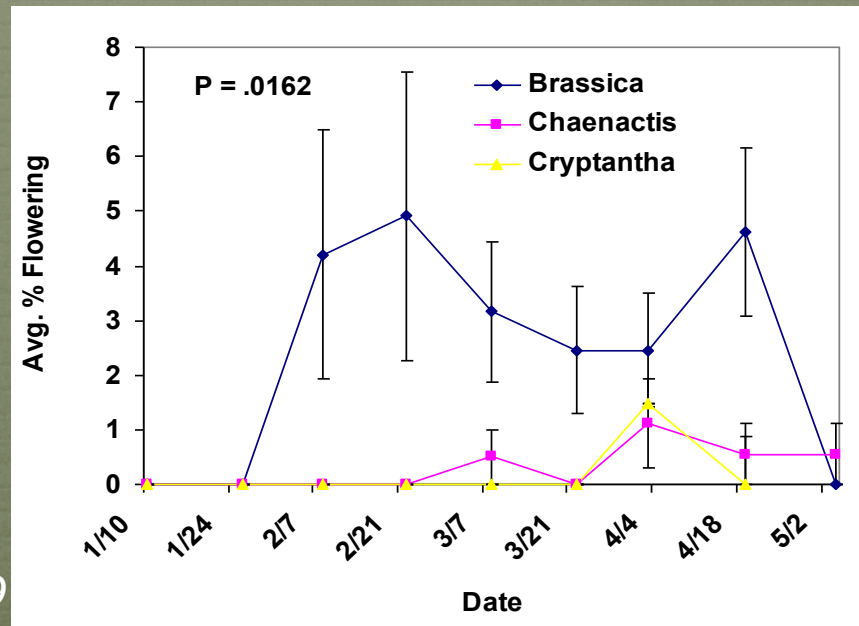
## Mustard

- ❖ Why is it a problem?
  - ❖ Grows faster than most native plants



# Ecology of Sahara Mustard

- ❖ Why is it a problem?
  - ❖ Grows faster than native plants
  - ❖ Flowers earlier than natives



Marushia and Holt 2009

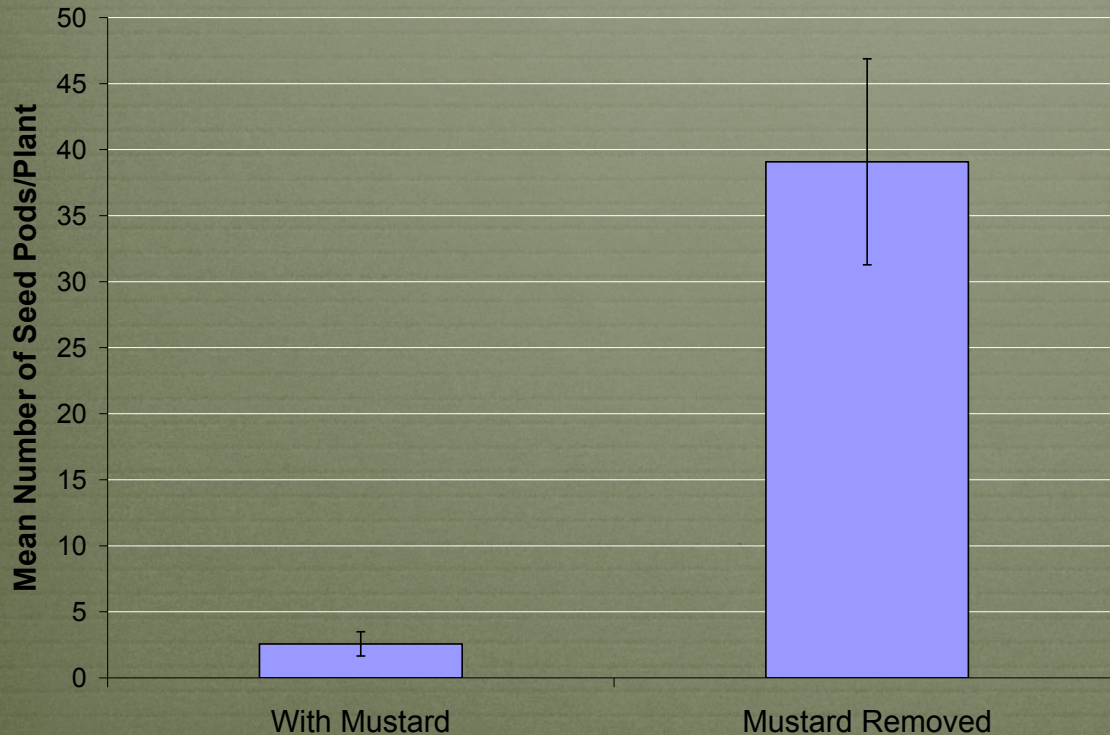
# Ecology of Sahara Mustard

- ❖ Why is it a problem?
  - ❖ Produces more seeds than natives



# Ecology of Sahara Mustard

- ❖ Why is it a problem?
- ❖ Reduces flowers/seeds of native plants



Coachella Valley milkvetch  
*Astragalus lentiginosus* var. *coachellae*  
State and Federal Endangered

# Ecology of Sahara Mustard

- ❖ Why is it a problem?
  - ❖ Grows faster than native plants
  - ❖ Flowers earlier than natives
  - ❖ Produces more seeds than natives
  - ❖ Reduces flowers/seeds of native plants
  - ❖ Why wasn't it a problem before the late 1990's?

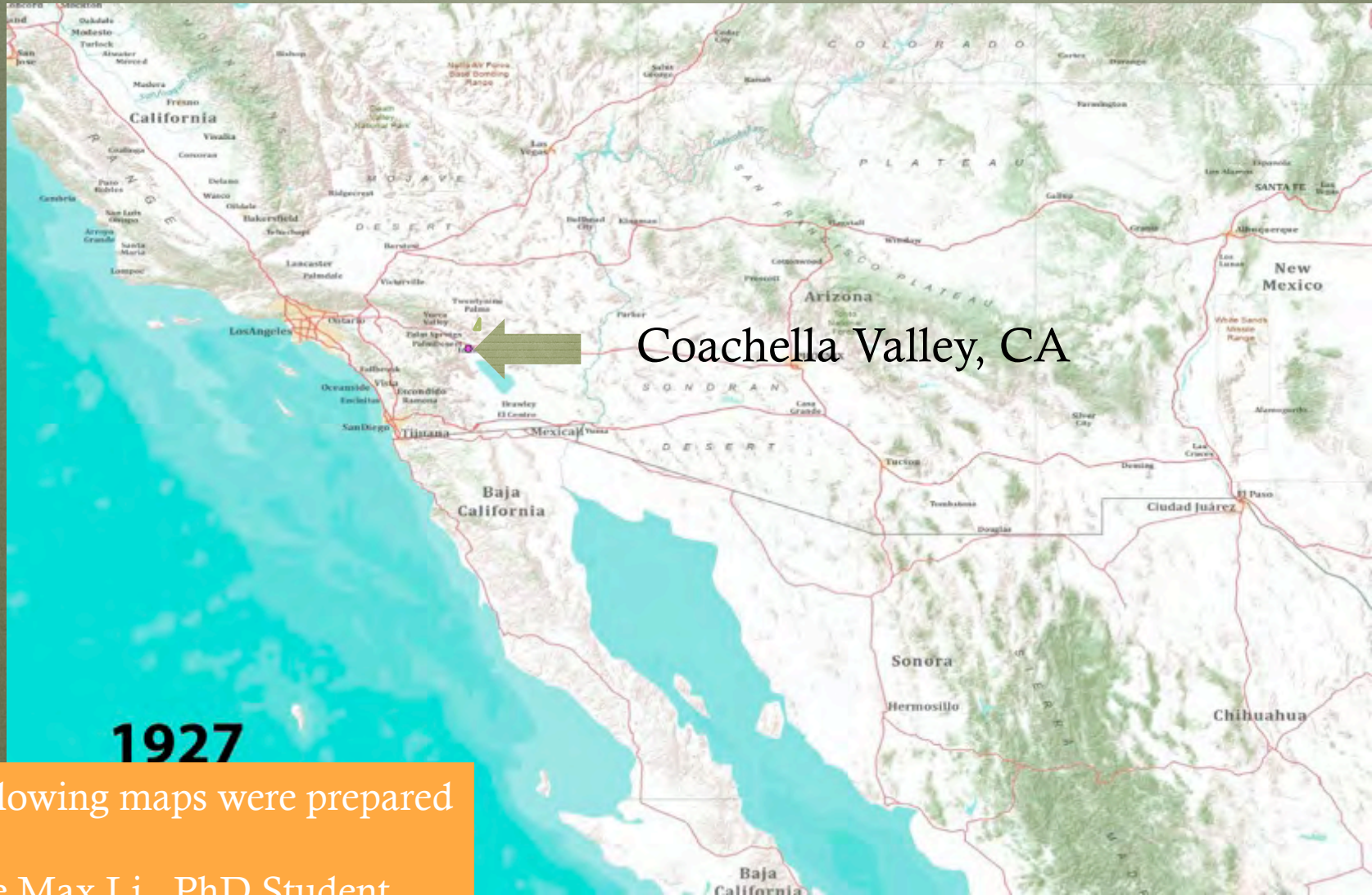
# Introduction

- ❖ Introduced in 1920's in Coachella Valley, CA
- ❖ Likely imported with Date Palms from Mediterranean





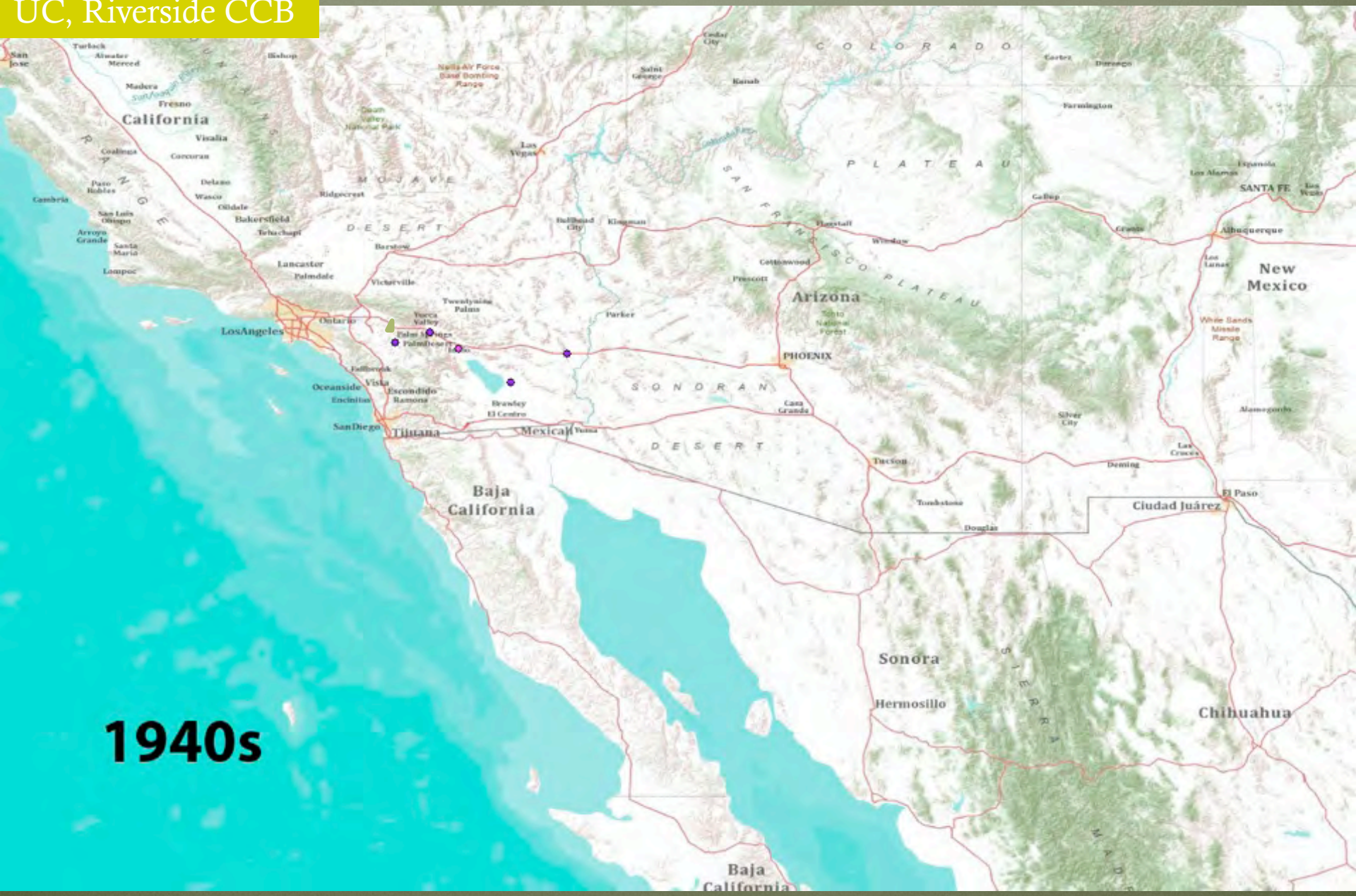
# Distribution



1927

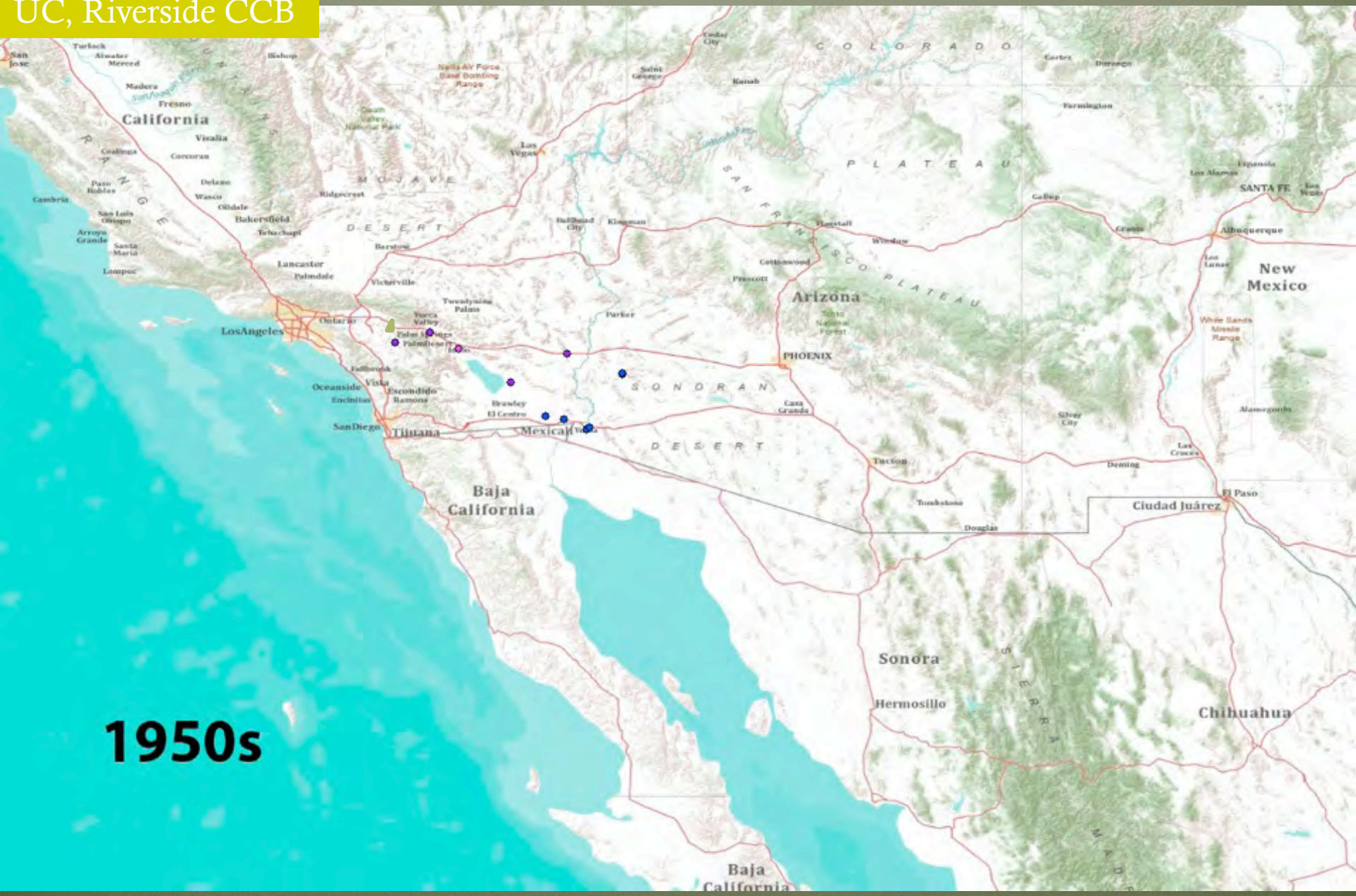
Following maps were prepared by  
Yue Max Li , PhD Student  
University of Arizona

# Cameron Barrows UC, Riverside CCB



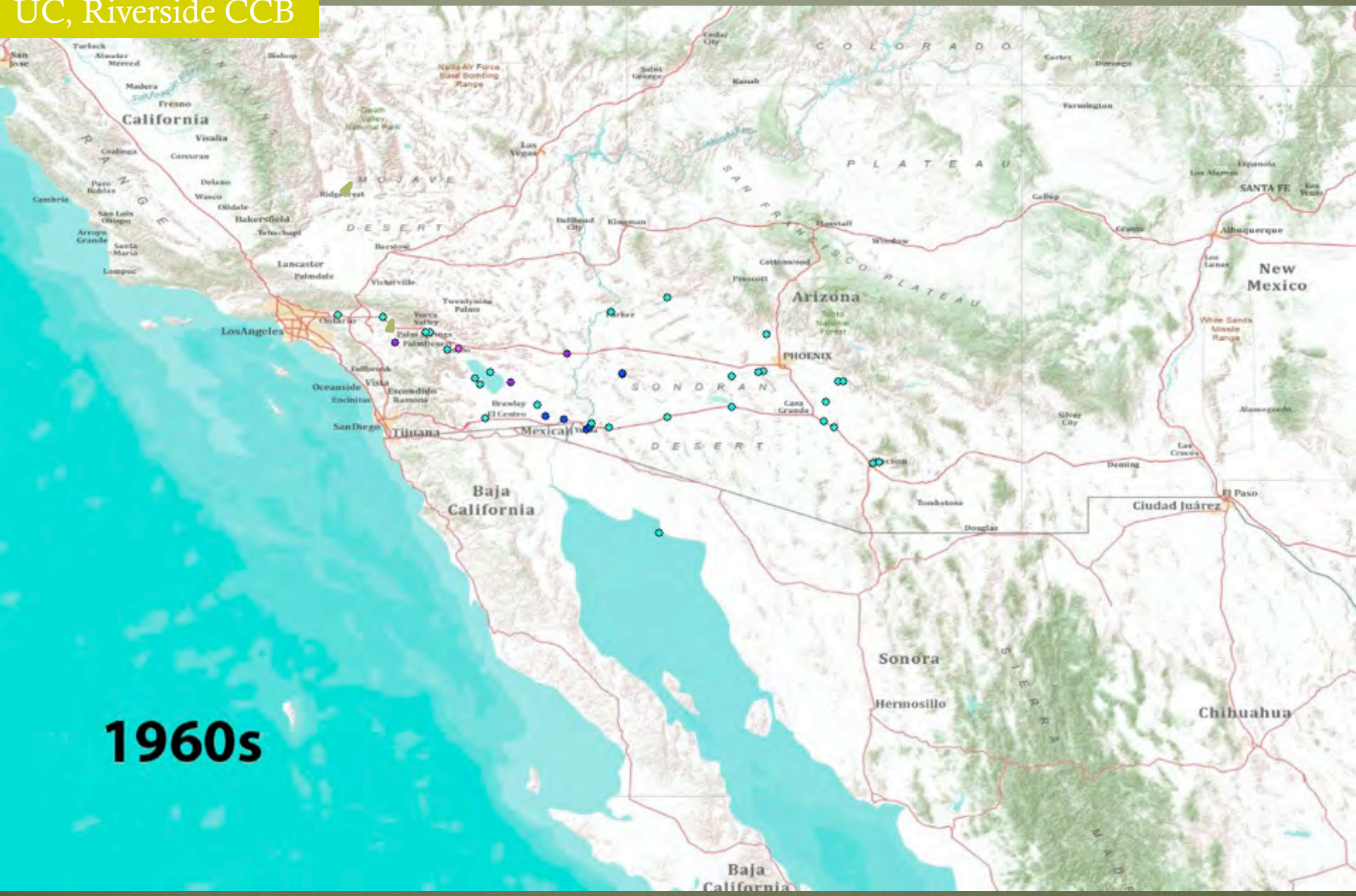
**1940s**

# Cameron Barrows UC, Riverside CCB



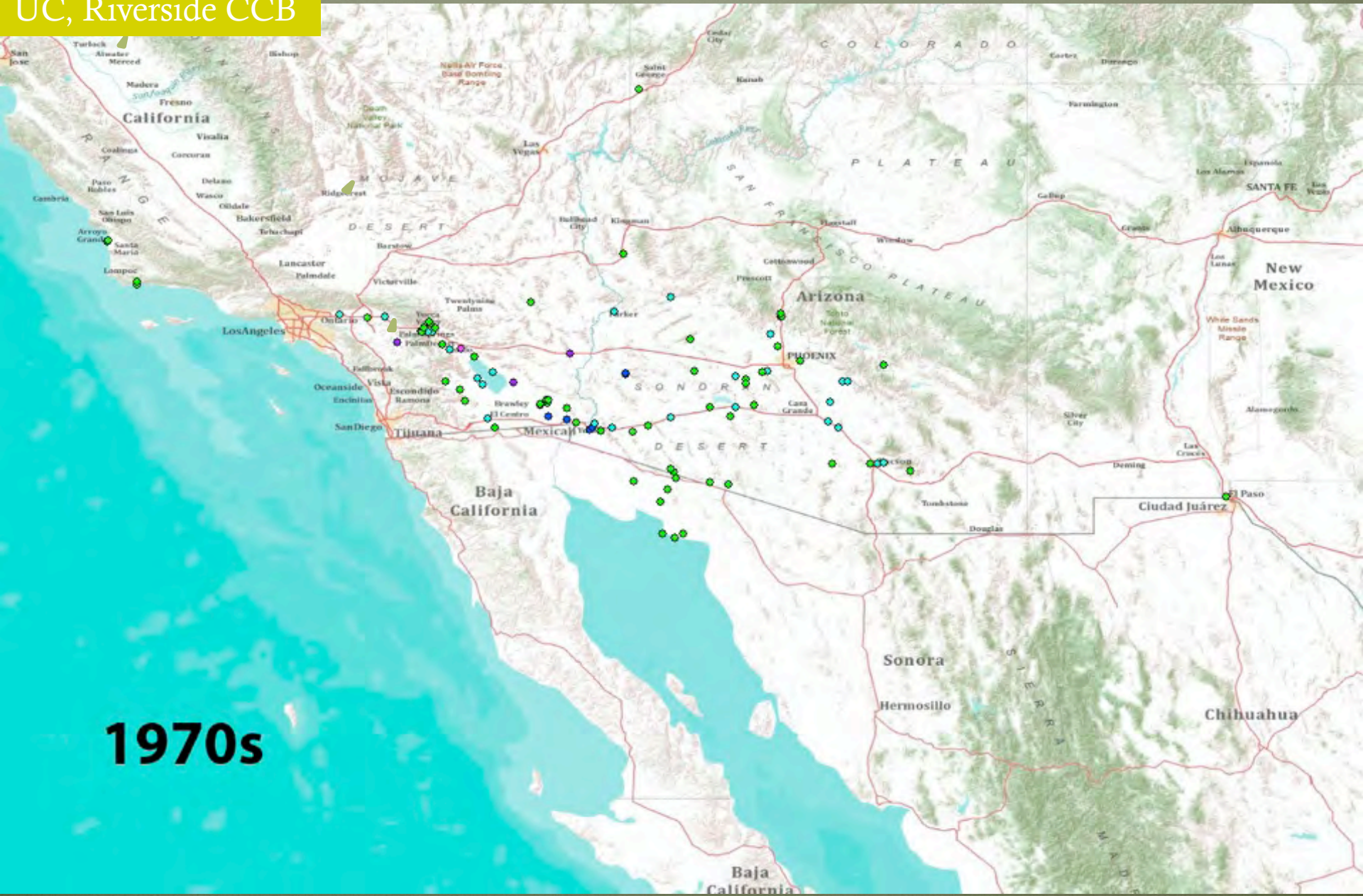
**1950s**

# Cameron Barrows UC, Riverside CCB

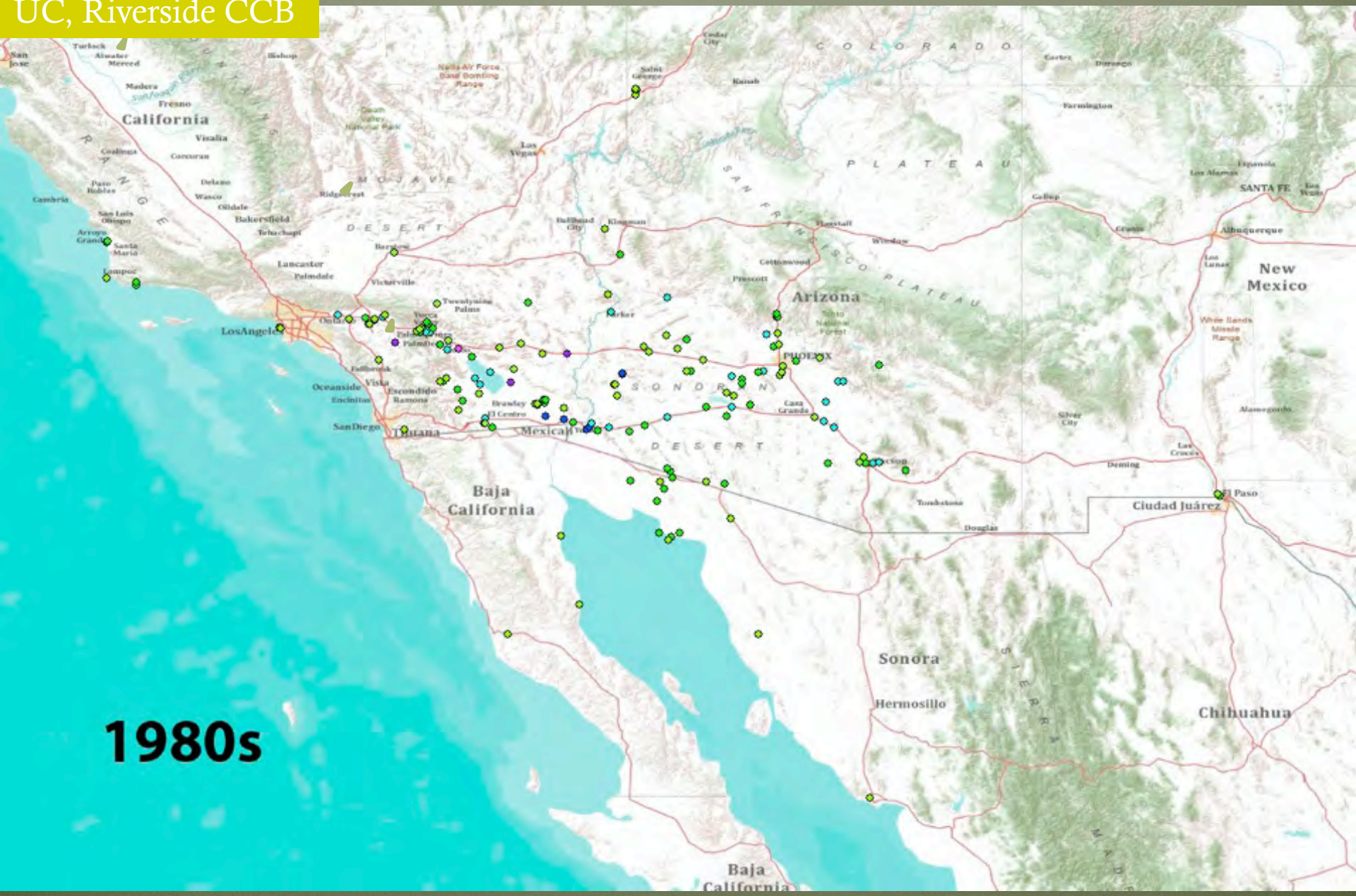


1960s

# Cameron Barrows UC, Riverside CCB

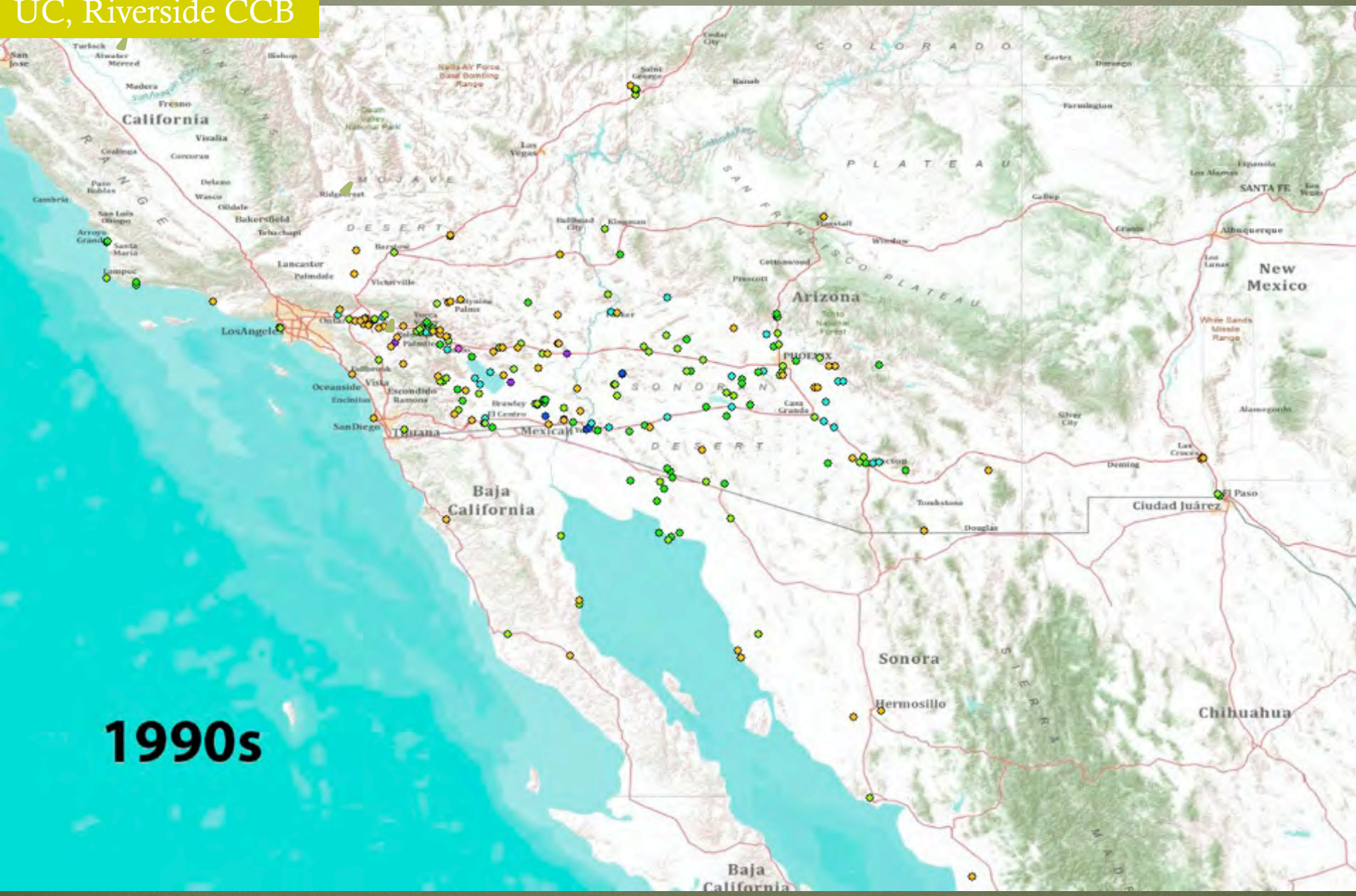


# Cameron Barrows UC, Riverside CCB



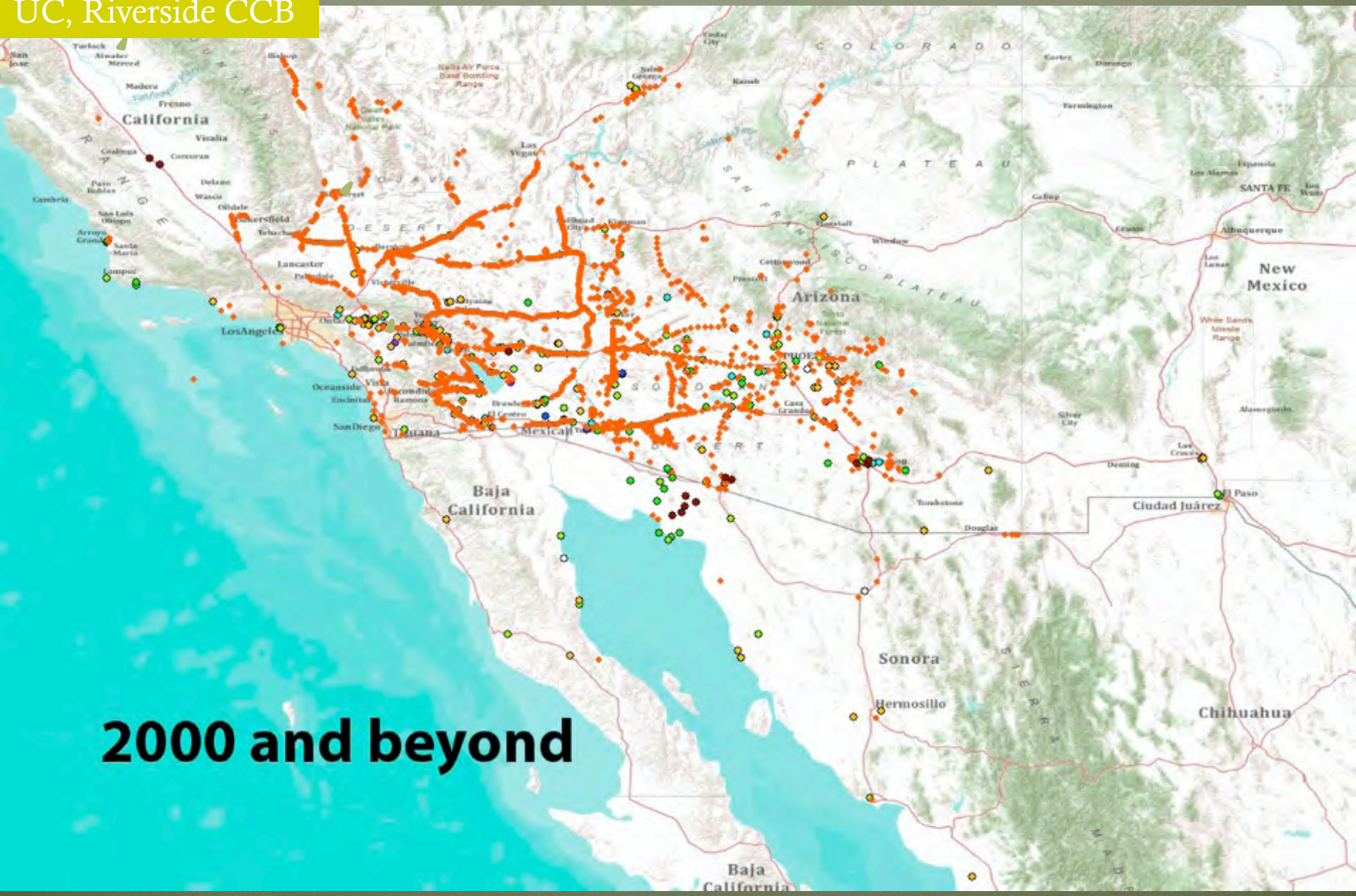
**1980s**

Cameron Barrows  
UC, Riverside CCB



1990s

Cameron Barrows  
UC, Riverside CCB



**2000 and beyond**



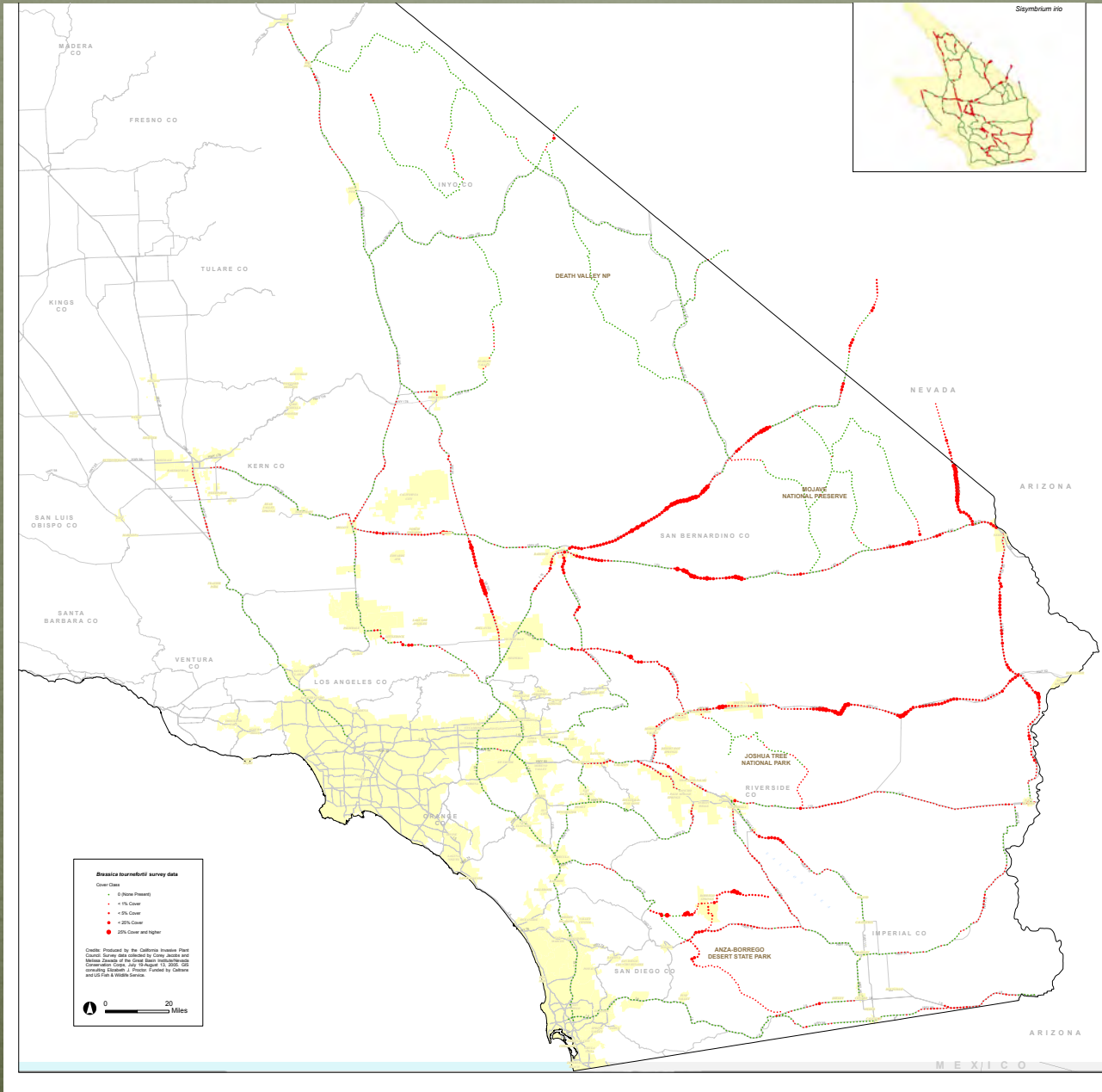
*During the day,  
I dress up like a  
**BOTANIST***

- ❖ Why wasn't Sahara mustard a problem until late 1990's?
  - ❖ It was a problem before then!
  - ❖ It hadn't become noticeable?
  - ❖ Not enough botanists?



The Botanist--Carl Spitzweg

# Sahara Mustard Distribution in 2005



# Management Options

- ❖ What are our management options?



# Management Options

❖ Hand Pulling

❖ Mulch

❖ Herbicide

❖ Prescribed Fire

❖ Livestock grazing

❖ Biocontrol

❖ Mechanical

Entire range:

~250,000 sq. mi.

160 M ac.

In California

~17,000 sq. mi.

11 M ac.



# Management Options

- ❖ Biocontrol

- ❖ Herbicide

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250,000 sq. mi.  
160M ac.

- ❖ Mechanical

- ❖ Hand Pulling

In California  
17,000 sq. mi.  
11M ac.

- ❖ ~~Livestock grazing~~

- ❖ ~~Mulch~~

- ❖ ~~Prescribed Fire~~

# Herbicide Research

- ❖ Find the best middle ground (second best solution)

Treatment	Density SM	%Cover SM	% Grass Cover	% Native Cover
Brush-B-Gon High	0	0	35	0.001
Brush-B-Gon Low	0.1	0.001	46	2.1
Telar High	1.4	0.3	44	0.25
Roundup High	4	0.5	1	2.5
Telar Low	1.1	0.6	44	1.4
Roundup Low	7	3	3	6.5
Hand Weed	8	4	28	28
Scythe High	10	6	12	6
Scythe Low	20	23	31	12
Untreated	21	38	32	7

# Questions?

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Photo Cameron Barrows